

March 27, 1998

**Fletcher N. Platt, Jr., P.E.**  
Executive Vice President

Mr. Paul Harvey  
Case Manager  
New Jersey Department of Environmental Protection  
Bureau of Federal Case Management  
401 East State Street, 5<sup>th</sup> Floor, P. O. Box 028  
Trenton, New Jersey 08625-0028

**Re: Groundwater Recovery System Performance Report - November 1997  
Madison Industries, Inc.**

Dear Mr. Harvey:

We have recently received a copy of the above referenced report and wish to make the following comments on behalf of the City of Perth Amboy. On page 2 of the report in the third paragraph, the following is stated:

"This on-site ditch (Pricketts Brook) appears to act as both a groundwater discharge and recharge mechanism on the Madison site and is mostly dry, except during rainfall episodes when upland runoff contributes to flow within the ditch. Surface water is usually evident at the ditch's lowest elevation on the Madison site, in the vicinity of the Madison/Perth Amboy property fence.

Madison collected surface water samples from the on-site ditch approximately once or twice per month for the duration of the performance test when there was little or no rainfall. The samples were identified as D-1, D-2, and D-3. Sample D-1 was collected just west of the bridge, D-2 was collected in the vicinity of RW-3, and D-3 was collected at the fence. The results of this sampling exercise are provided on Table 2. Concentrations of zinc in the D-1, D-2, and D-3 samples ranged from 0.2 mg/l to 3.5 mg/l, 1.6 mg/l to 34.3 mg/l, 5.9 mg/l to 33.9 mg/l, respectively. Figure 8 provides a graphical representation of this data."

This data indicates that all samples collected at the Madison Industry/Perth Amboy fence line exceeded the water quality standards of 5 mg/l. The water sampled at this location flows down stream onto the City of Perth Amboy Runyon Watershed where waters from the brook recharge the aquifers from which the City's wells draw the water supply. This sampling exercise conducted by Madison Industries from March, 1997 through December, 1997 confirms that the heavy metals contamination on the Madison Industries' site is neither contained nor controlled.

**Why hasn't NJDEP taken any action with regard to this continuing release?**



Mr. Paul Harvey

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Both sampling locations D-2 and D-3 in Pricketts Brook are along side two potential sources for the heavy metals release. The area immediately along the northern side of Pricketts Brook is the location where for years Madison Industries stored in outside open piles materials containing high concentrations of zinc. The piles have been removed but it is suspected that residuals from this heavy metals pile are in the soils beneath this area.

The second potential source for this contamination in Pricketts Brook is the surface water retention basin immediately along the southern bank of Pricketts Brook near the fence line. This surface water retention basin receives runoff from the macadam surface of Madison Industries where historically, solid and liquid materials containing high concentrations of heavy metals have been released.

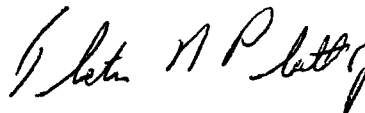
We request that NJDEP direct Madison Industries to investigate and identify the source of the heavy metals entering Pricketts Brook which are being discharged on to the City of Perth Amboy property.

The Madison Industries' Groundwater Recovery System Performance Report only presents analyses of zinc concentrations. There are three (3) other metals of concern identified on the Madison Industries' site (cadmium, copper and lead) which should also be sampled and analyzed. We believe that there may be different releases and/or sources contributing to the contamination plume of the various metals.

We request that you respond to these concerns and advise the City of Perth Amboy when NJDEP will take action against Madison Industries to provide for the containment and control for the contamination on their site. Should you wish to discuss this matter in further detail, do not hesitate to contact us.

Very truly yours,

KILLAM ASSOCIATES



Fletcher N. Platt, Jr., P.E.

enc.: Letter December 31, 1997

cc: Mayor Joseph Vas  
Louis Perez-Jimenez  
Leah Healey, Esq.  
John Osolin, USEPA  
Charles Licata, Esq.

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# Madison industries inc.

C-97-12-01

December 31, 1997

Mr. Paul Harvey  
Case Manager  
New Jersey Department of Environmental Protection  
Bureau of Federal Case Management  
401 East State Street, 5th Floor, P.O. Box 028  
Trenton, NJ 08625-0028

RE: Groundwater Recovery System Performance Report – November 1997  
Madison Industries, Inc.

Dear Mr. Harvey:

This letter report provides a summary of groundwater system performance for November 1997. This report is the last of six monthly reports prepared by Madison Industries, Inc. (Madison) for this phase of the shallow groundwater interim remedial action approved by the New Jersey Department of Environmental Protection (Department) in May 1997. This report also provides a summary of system performance for the entire test period, June 1997 through November 1997, as well as conclusions and recommendations pertaining to the shallow groundwater recovery system (RS-1) and other recovery wells on the Madison site.

Table 1 provides a summary of monitoring locations and groundwater level elevations for May 27, 1997 through November 24, 1997. Figure 1 provides a groundwater level contour map for the data obtained on November 24, 1997. This contour map was produced using geostatistical software and best professional judgement; some locations and detail are approximate. As shown, the capture zone of RS-1 is estimated to extend approximately 130 to 150 feet down gradient of RS-1 and provides groundwater control over the area that was suspected to contain elevated levels of zinc in groundwater. Despite minor fluctuations in groundwater level elevations on site during the performance test period, the capture zone of RS-1 and its influence on the direction of groundwater flow in the area of the recovery system has not varied significantly. It should be noted that, with the Department's authorization, RW-4 and RW-6 were inactive for the duration of the performance test.

Table 2 provides a summary of zinc concentrations, in milligrams per liter (mg/l), for the period of February 12, 1997 through December 3, 1997. As shown on the table, the average concentration of zinc from RS-1 on December 3 was 126.0 mg/l; this value is the lowest recorded zinc concentration since monitoring began in February. Concentrations of zinc ranged from 17.0 mg/l in RS-1C to 257.0 mg/l in RS-1A, and the concentration of zinc in down gradient monitoring well MI-9 was 2.67 mg/l on November 24. It is important to note that the average zinc concentration in RS-1 was as high as 1,195 mg/l on February 17, 1997 and that average zinc concentrations have decreased by more than 89 percent during the performance test period. Zinc concentrations, once as high as 1,860 mg/l in RS-1C, have decreased 99 percent to a low of 17.0 mg/l. The average concentration of zinc in RS-1 continues a downward trend despite several fluctuations; Figure 2

provides a graphical representation of the average zinc concentration data and linear regression trend line since February 1997. Figure 3 provides a graphical representation of zinc concentration data for RS-1A and RS-1B for the same period. As shown on Figure 3, zinc concentrations in RS-1A and RS-1B continued to decrease rapidly until late July 1997. From that period forward, zinc concentrations continued to decrease at a lesser rate and have generally been below 400.0 mg/l. Figure 4 provides a graphical representation of zinc concentrations data for RS-1A and RS-1B for the period of July 1, 1997 through December 3, 1997. Figure 5 provides a graphical representation of zinc concentration data for RS-1C and RS-1D since February 1997. Zinc concentrations in RS-1C and RS-1D decreased rapidly until mid April 1997 and then also continued to decrease at a lesser rate, but have remained generally below 100.0 mg/l. Figure 6 provides a graphical representation of zinc concentration data for RS-1C and RS-1D for the period of July 1, 1997 through December 3, 1997. As previously mentioned, concentrations of zinc in RS-1C and RS-1D were 17.0 mg/l and 66.0 mg/l, respectively, on December 3, 1997.

Table 3 provides a summary of zinc concentrations for selected wells on and in the vicinity of the Madison site for the 12 Performance Monitoring Periods (PMPs) from December 1994 through September 1997. These wells include: MI-2A, MI-7, MI-9, MI-T1, RS-1, RW-4, and RW-6 on the Madison site; and RW-2, WCC-11M, WCC-12, WCC-15M, and WCC-16VS located on the Perth Amboy watershed property. Figure 7 provides a graphical representation of zinc concentrations for three of the wells on and in the immediate vicinity of the Madison site -- RW-4, RW-6, and WCC-11M. As shown on Table 3 and Figure 7, there was a decrease in zinc concentrations in RW-4, RW-6, and WCC-11M beginning with the March 1997 PMP, one month after the startup of RS-1, and continuing through the September 1997 PMP. In fact, the concentrations of zinc in RW-4, RW-6, and WCC-11M, decreased 97 percent, 96 percent, and 96 percent, respectively, from the December 1996 PMP to the September 1997 PMP. Concentrations of zinc also decreased in MI-7, MI-T1, RW-2, and WCC-15M to a lesser degree.

Madison also collected and evaluated periodic surface water samples from the on-site ditch down gradient of RS-1 during this performance test period. The purpose of this effort was to determine if RS-1 would affect changes in zinc concentrations in surface water within the on-site ditch down gradient of the shallow recovery system. This on-site ditch appears to act as both a groundwater discharge and recharge mechanism on the Madison site and is mostly dry, except during rainfall episodes when upland runoff contributes to flow within the ditch. Surface water is usually evident at the ditch's lowest elevation on the Madison site, in the vicinity of the Madison/Perth Amboy property fence.

Madison collected surface water samples from the ditch approximately once or twice per month for the duration of the performance test when there was little or no rainfall. These samples were identified as D-1, D-2, and D-3. Sample D-1 was collected just west of the bridge, D-2 was collected in the vicinity of RW-3, and D-3 was collected at the fence. The results of this sampling exercise are provided on Table 2. Concentrations of zinc in the D-1, D-2, and D-3 samples ranged from 0.2 mg/l to 3.5 mg/l, 1.6 mg/l to 34.3 mg/l, 5.9 mg/l to 33.9 mg/l, respectively. Figure 8 provides a graphical representation of this data.

Additionally, Madison evaluated previous PMP data from December 1994 through September 1997. As shown on Table 3, concentrations of zinc in SW-2 (equivalent to sample location D-3) had been as high as 470.0 mg/l and 415.0 mg/l in June 1996 and September 1996, respectively. These samples were collected during periods of minimal precipitation with little or no flow in the ditch. During the same periods in 1997, the concentrations of zinc were 22.7 mg/l and 28.3 mg/l at D-3, again with little or no flow in the ditch. A comparison of these PMP results and the results of the ditch samples collected during the performance test indicates that RS-1 has a significant effect on the concentrations of zinc in the ditch. In fact, comparing the PMP results alone, there was a 95 percent and 93 percent reduction, respectively, in zinc concentrations between the samples

collected in the June and September 1996 and the samples collected in June and September 1997. These reductions appear to be consistent with the reductions in zinc concentrations in RS-1 and the down gradient monitoring points. As previously discussed zinc concentrations as low as 5.9 mg/l have been recorded at the D-3 sample location.

In conclusion, zinc concentrations in RS-1 continue to decrease; however, more importantly, zinc concentrations in monitoring wells at and in the vicinity of the Madison site appear to be decreasing as well. It is Madison's opinion that the RS-1 performance test, with the approved exclusion of RW-4 and RW-6, was successful and that RS-1 continues to be effectively and efficiently removing elevated levels of zinc from the Old Bridge Aquifer. Additionally, RS-1 appears to have a significant influence over the concentrations of zinc in the surface water in the on-site ditch, despite flow or upland runoff conditions.

Therefore, Madison recommends that RW-4 and RW-6 remain inactive indefinitely. Although RW-4 and RW-6 may have influenced groundwater flow at and in the vicinity of the site at some point, both wells lacked zinc-recovery efficiency because of well depth and/or high pump capacity. Madison also proposes to eliminate the use of RS-1C, because of its relatively low zinc concentrations, allowing the remaining three wells, RS-1A, RS-1B, and RS-1D to remove zinc more efficiently. Madison may propose to eliminate RS-1D at some future point in time. Madison further proposes to monitor the performance of RS-1, including the down gradient monitoring well MI-9 and surface water at the D-3 location, on a monthly basis and incorporate the results and findings with the quarterly PMP reports.

If you have any questions regarding this report, please do not hesitate to contact either Frank Holloway or me.

Sincerely,

MADISON INDUSTRIES, INC.



Barry J. Vroeginday, CPG  
Director, Site Remediation

Enclosure

cc: Bruce Bzura, Madison Industries (w/enc.)  
Susan Gieser, Esq., Madison Industries (w/enc.)  
Frank Holloway, Madison Industries (w/enc.)  
John Osolin, USEPA (w/enc.)  
Lawrence Pollex, City of Perth Amboy (w/enc.)

**TABLE 1**  
**SUMMARY OF MONITORING LOCATIONS**  
**AND GROUNDWATER LEVEL ELEVATIONS(1)**  
**GROUNDWATER RECOVERY SYSTEM PERFORMANCE REPORT - NOVEMBER 1997**  
**MADISON INDUSTRIES, INC.**

WELL/ LOCATION NUMBER	WELL DEPTH (S/D)	WELL/ LOCATION ELEVATION	GROUNDWATER ELEVATION								
			27-May-97	28-May-97	29-May-97	16-18-May-97	31-Jul-97	29-Aug-97	30-Sep-97	28-Oct-97	24-Nov-97
CPS-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MI-2A	S	22.09	16.63	16.64	16.65	16.53	16.77	16.33	15.99	15.80	16.19
MI-3	S	22.77	17.50	18.78	18.82	18.57	18.88	18.47	18.10	17.21	18.30
MI-4	S	24.17	21.97	22.02	22.03	21.85	22.05	21.62	20.89	20.57	21.24
MI-5	S	25.25	23.18	22.40	22.41	22.95	23.14	22.70	22.02	21.83	22.39
MI-6	D	26.48	21.43	21.61	21.55	21.51	21.63	17.56	20.50	20.20	20.77
MI-7	S	23.80	18.29	18.37	18.35	18.03	18.37	17.76	17.28	17.08	17.66
MI-8	S	25.15	17.87	18.88	18.88	18.69	18.98	18.55	18.22	18.06	18.44
MI-9	S	25.69	18.74	18.28	18.92	18.75	19.09	18.59	18.12	17.88	18.39
MI-T1	S	23.79	17.94	17.93	17.93	17.74	18.06	17.53	17.03	18.92	17.24
RS-1A	S	24.99	15.94	15.95	15.94	16.28	18.82	16.23	15.86	15.41	15.84
RS-1B	S	25.08	15.97	15.94	15.92	16.39	16.68	16.26	15.72	15.32	15.87
RS-1C	S	25.10	16.84	16.87	16.85	17.10	17.34	17.00	16.50	16.21	16.70
RS-1D	S	25.12	15.87	16.44	16.37	15.97	15.82	17.60	15.50	15.20	13.71
RW-3	D	24.89	19.21	19.57	19.46	19.36	19.63	18.70	18.63	18.04	18.88
RW-4	D	23.93	12.48	19.08	19.07	19.04	18.53	19.38	18.46	18.27	18.69
RW-6	S	21.47	16.48	16.66	16.65	16.50	16.67	16.37	16.07	15.92	16.30
WFH-3	S	27.53	19.63	19.84	19.22	18.67	19.23	19.15	18.00	19.64	18.40
X-1	S	22.82	18.29	18.59	18.61	18.32	18.62	18.13	17.67	17.49	17.97
X-2	S	23.12	18.14	18.48	18.50	18.18	18.57	18.06	17.60	17.42	17.87
X-3	S	24.43	18.37	18.87	18.90	18.71	18.95	18.48	18.03	17.82	17.38
X-4	S	23.09	17.85	18.63	18.66	17.45	18.71	18.27	17.89	17.71	16.83
X-5	S	23.41	17.43	18.59	18.63	18.46	18.71	18.31	17.95	17.79	18.14
X-6	S	18.69	13.90	13.92	13.93	13.73	14.41	13.57	13.15	14.01	13.37
X-7	S	18.76	14.68	14.88	14.83	14.50	15.16	13.71	14.03	13.04	13.29
MI-SG	NA	25.70	19.24	19.26	19.14	19.13	19.06	18.50	18.00	18.25	NA

**NOTES:**

S - Designated as a shallow well (< 40 feet in depth)

D - Designated as a deep well (> 40 feet in depth)

(1) - All elevations in feet above/below Mean Sea Level (MSL)

NA - Not available/applicable

**TABLE 2**  
**SUMMARY OF ZINC CONCENTRATIONS (MG/L)**  
**GROUNDWATER RECOVERY SYSTEM PERFORMANCE REPORT - NOVEMBER 1997**  
**MADISON INDUSTRIES, INC.**

DATE SAMPLED	RECOVERY SYSTEM WELLS					WATER TREAT. COMP.	MONITORING/ OBSERVATION WELLS			SURFACE WATER		
	RS-1A	RS-1B	RS-1C	RS-1D	AVG.		X-6	X-7	MI-9	D-1	D-2	D-3
2/12/97	750	1000	1860	1150	1190	990	1500	1210	1040.00	0.8		
2/13/97	740	980	1350	950	1005							
2/14/97	1070	1630	1810	1210	1430				890.00			
2/15/97	NA	NA	NA	NA	NA							
2/17/97	1010	1540	1570	660	1195							
2/18/97	1020	1460	1320	670	1118				740.00			
2/19/97	880	1310	1240	620	1013							
2/20/97	1130	1390	1270	730	1130							
2/21/97	1090	1330	1110	486	1004	1095			423.00			
2/22/97	NA	NA	NA	NA	NA	1005						
2/24/97	1080	1520	980	530	1028	915						
2/25/97	1140	1230	870	660	975	975			690.00			
2/26/97	910	1010	820	650	848	710						
2/27/97	1290	1240	730	480	935	690						
2/28/97	870	1110	570	220	693	675			226.00			
3/01/97	NA	NA	NA	NA	NA	675						
3/03/97	840	1030	780	590	810	685						
3/04/97	1000	1040	550	332	731	730			212.00			
3/05/97	850	930	480	410	668	600						
3/06/97	790	840	650	490	693	700						
3/07/97	790	870	440	430	633	650			84.00			
3/07/97	NA	NA	NA	NA	NA	775						
3/10/97	660	1020	421	281	596	720						
3/11/97	870	1070	372	246	640	745	249	107	102.00	0.6	1.6	25.0
3/12/97	690	930	570	490	670	519						
3/13/97	770	800	540	470	645	470						
3/14/97	880	910	570	490	713	412			64.00			
3/15/97	880	910	570	490	713	487						
3/17/97	680	820	273	223	499	358						
3/18/97	890	940	325	268	606	364						
3/19/97	820	890	295	239	561	696						
3/20/97	930	1040	500	500	743	660						
3/21/97	890	990	650	620	788	516			46.80			
3/22/97	NA	NA	NA	NA	NA	536						
3/24/97	810	NA	304	240	451	428						
3/25/97	810	NA	296	233	446	572			34.70			
3/26/97	870	NA	325	191	462	650						
3/27/97	790	NA	530	283	534	568						
3/28/97	NA	NA	NA	NA	NA	575						
3/31/97	810	NA	650	317	592	880						
4/1/97	880	NA	590	339	603	625			32.90			
4/2/97	810	NA	666	225	567	360						
4/3/97	970	NA	555	259	595	498						
4/4/97	830	960	425	209	606	642			56.00			
4/5/97	NA	NA	NA	NA	NA	725						
4/7/97	640	930	307	268	536	370						
4/8/97	1000	1040	238	228	627	530						
4/9/97	890	970	208	212	570	565			84.00			

TABLE 2

## SUMMARY OF ZINC CONCENTRATIONS (MG/L)

## GROUNDWATER RECOVERY SYSTEM PERFORMANCE REPORT - NOVEMBER 1997

MADISON INDUSTRIES, INC.

DATE SAMPLED	RECOVERY SYSTEM WELLS					WATER TREAT. COMP.	MONITORING/ OBSERVATION WELLS			SURFACE WATER		
	RS-1A	RS-1B	RS-1C	RS-1D	AVG.		X-6	X-7	MI-9	D-1	D-2	D-3
4/10/97	690	800	197	243	483	483						
4/11/97	730	960	268	298	564	515			60.00			
4/12/97	NA	NA	NA	NA	NA	507						
4/14/97	680	960	195	222	514	499						
4/15/97	830	820	NA	244	631	552			61.00	0.6	34.3	9.4
4/16/97	790	950	113	152	501	424						
4/17/97	690	840	151	196	469	469						
4/18/97	690	830	119	170	452	540			35.50			
4/21/97	870	1030	213	231	586	440						
4/22/97	800	960	271	381	603	504			48.20			
4/23/97	NA	1050	322	370	581	523						
4/24/97	NA	1040	365	309	571	417						
4/25/97	NA	1420	357	298	692	720			41.50			
4/26/97	409	850	256	278	448	690						
4/28/97	970	1100	226	240	634	469						
4/29/97	790	1010	124	137	515	434			16.50			
4/30/97	920	990	158	229	574	473						
5/1/97	840	1040	185	255	580	449						
5/2/97	680	730	123	167	425	525			28.30			
5/3/97	NA	NA	NA	NA	NA	565						
5/5/97	800	810	149	241	500	355						
5/6/97	1180	930	207	334	663	408			38.70			
5/7/97	800	840	103	179	481	410						
5/8/97	640	700	109	172	405	441						
5/9/97	1100	1200	400	566	817	458			46.00			
5/10/97	NA	NA	NA	NA	NA	431						
5/12/97	830	780	132	188	483	422						
5/13/97	1120	1370	180	268	735	399			29.00			
5/14/97	980	1020	164	237	600	414				0.4	11.0	10.7
5/15/97	940	1050	139	219	587	305						
5/16/97	940	1000	148	229	579	264			22.70			
5/17/97	NA	NA	NA	NA	NA	339						
5/19/97	720	880	75	148	456	363						
5/20/97	288	243	60.9	197	197	340			111.00			
5/21/97	940	1020	151	210	580	476						
5/22/97	690	810	121	173	449	334			17.40			
5/23/97	730	890	118	155	473	367			33.20			
5/24/97	NA	NA	NA	NA	NA	543						
5/27/97	970	950	169	203	573	400			18.80	0.2	11.5	5.9
5/28/97	1070	990	182	240	621	338						
5/29/97	820	920	175	214	532	320						
5/30/97	730	840	140	175	471	309			22.70			
5/31/97	NA	NA	NA	NA	NA	317						
6/1/97	NA	NA	NA	NA	NA	324						
6/2/97	850	910	129	191	520	275						
6/3/97	740	810	132	146	457	600			13.40			
6/4/97	630	720	104	152	402	381						
6/5/97	549	550	90	133	331	304						

TABLE 2

## SUMMARY OF ZINC CONCENTRATIONS (MG/L)

## GROUNDWATER RECOVERY SYSTEM PERFORMANCE REPORT - NOVEMBER 1997

MADISON INDUSTRIES, INC.

DATE SAMPLED	RECOVERY SYSTEM WELLS					WATER TREAT. COMP.	MONITORING/ OBSERVATION WELLS			SURFACE WATER		
	RS-1A	RS-1B	RS-1C	RS-1D	AVG.		X-6	X-7	MI-9	D-1	D-2	D-3
6/6/97	760	640	98	123	405	167			10.30			
6/7/97	NA	NA	NA	NA	NA	167						
6/8/97	NA	NA	NA	NA	NA	298						
6/9/97	590	690	94	134	377	320				0.95	10.8	20.9
6/10/97	520	600	75	136	333	360			9.70			
6/11/97	590	640	89	117	359	316						
6/12/97	570	610	83	124	347	281						
6/13/97	650	660	101	145	389	318			10.40			
6/14/97	NA	NA	NA	NA	NA	324						
6/15/97	NA	NA	NA	NA	NA	318						
6/16/97	590	550	91	123	339	280						
6/17/97	590	660	95	119	366	280						
6/18/97	488	509	78	119	299	290			9.00			
6/19/97	560	580	80	136	339	275						
6/20/97	560	630	73	103	342	273			7.00			
6/21/97	NA	NA	NA	NA	NA	258						
6/22/97	NA	NA	NA	NA	NA	274						
6/23/97	437	464	106	150	289	283				1.2	12.8	24.4
6/24/97	660	680	97	150	397	250			7.10			
6/25/97	640	590	89	362	420	273						
6/26/97	840	1020	113	148	530	290						
6/27/97	310	440	86	123	240	260			8.00			
6/28/97	NA	NA	NA	NA	NA	283						
6/29/97	NA	NA	NA	NA	NA	268						
6/30/97	370	460	72	142	261	270						
7/1/97	413	498	86	122	280	251			13.10			
7/2/97	540	500	78	123	310	252						
7/3/97	490	510	74	110	296	205						
7/4/97	NA	NA	NA	NA	NA	240						
7/5/97	NA	NA	NA	NA	NA	233						
7/6/97	NA	NA	NA	NA	NA	96						
7/7/97	560	580	75	96	328	95						
7/8/97	830	850	77	89	462	141			9.40			
7/9/97	400	428	72	106	252	198						
7/10/97	540	550	77	99	317	189						
7/11/97	700	740	96	129	416	270			8.20			
7/12/97	NA	NA	NA	NA	NA	270						
7/13/97	NA	NA	NA	NA	NA	150						
7/14/97	392	408	85	117	251	255						
7/15/97	236	296	79	83	174	178			8.90			
7/16/97	459	404	85	118	267	235						
7/17/97	330	245	69	82	182	300						
7/18/97	298	327	78	91	199	199			7.80			
7/19/97	NA	NA	NA	NA	NA	216						
7/20/97	NA	NA	NA	NA	NA	500						
7/21/97	411	418	72	104	251	431				3.5	30.1	33.9
7/22/97	338	376	72	89	219	226			4.56			
7/23/97	404	444	74	88	253	194						

**TABLE 2**  
**SUMMARY OF ZINC CONCENTRATIONS (MG/L)**  
**GROUNDWATER RECOVERY SYSTEM PERFORMANCE REPORT - NOVEMBER 1997**  
**MADISON INDUSTRIES, INC.**

DATE SAMPLED	RECOVERY SYSTEM WELLS					WATER TREAT. COMP.	MONITORING/ OBSERVATION WELLS			SURFACE WATER		
	RS-1A	RS-1B	RS-1C	RS-1D	AVG.		X-6	X-7	MI-9	D-1	D-2	D-3
7/24/97	NA	367	NA	80	224	220						
7/25/97	NA	NA	NA	NA	NA	NA			18.60			
7/26/97	308	317	60	75	190	241						
7/27/97	NA	NA	NA	NA	NA	189						
7/28/97	NA	NA	NA	NA	NA	107						
7/29/97	428	493	80	104	276	214			5.40			
7/30/97	NA	296	85	93	158	218						
7/31/97	NA	NA	NA	NA	NA	NA						
8/1/97	274	288	87	99	187	NA			3.68			
8/2/97	NA	NA	NA	NA	NA	NA						
8/3/97	NA	NA	NA	NA	NA	NA						
8/4/97	295	323	64	76	190	NA						
8/5/97	341	337	70	83	208	NA			4.47			
8/6/97	452	371	69	88	245	NA						
8/7/97	355	351	62	82	213	NA						
8/8/97	304	286	56	78	181	NA			4.78			
8/9/97	NA	NA	NA	NA	NA	NA						
8/10/97	NA	NA	NA	NA	NA	NA						
8/11/97	383	355	48	77	216	NA						
8/12/97	345	363	59	85	213	NA			4.51			
8/13/97	219	227	85	91	156	NA						
8/14/97	360	382	75	95	228	NA						
8/15/97	338	336	84	92	213	NA			3.86			
8/16/97	370	364	49.1	90	218	NA						
8/17/97	NA	NA	NA	NA	NA	NA						
8/18/97	NA	NA	NA	NA	NA	NA						
8/19/97	458	438	109	151	289	NA			4.86	1.4	7.6	14.4
8/20/97	399	413	50.9	113	244	NA						
8/21/97	398	383	46.6	105	233	NA						
8/22/97	400	413	103	131	262	NA			13.10			
8/23/97	NA	NA	NA	NA	NA	NA						
8/24/97	NA	NA	NA	NA	NA	NA						
8/25/97	NA	NA	NA	NA	NA	NA						
8/26/97	335	355	43.7	82	204	NA			2.93			
8/27/97	318	368	47	89	206	NA						
8/28/97	305	307	45.4	88	186	NA						
8/29/97	350	346	45	76	204	NA			3.27			
8/30/97	NA	NA	NA	NA	NA	NA						
8/31/97	NA	NA	NA	NA	NA	NA						
9/1/97	NA	NA	NA	NA	NA	NA						
9/2/97	302	289	32	74	174	NA			2.08			
9/3/97	381	458	59	80	245	NA						
9/4/97	NA	NA	NA	NA	NA	NA						
9/5/97	276	350	35	69	183	NA			3.06			
9/6/97	NA	NA	NA	NA	NA	NA						
9/7/97	NA	NA	NA	NA	NA	NA						
9/8/97	515	442	50	97	276	NA						
9/9/97	427	310	39	68	211	NA						

TABLE 2

## SUMMARY OF ZINC CONCENTRATIONS (MG/L)

## GROUNDWATER RECOVERY SYSTEM PERFORMANCE REPORT - NOVEMBER 1997

MADISON INDUSTRIES, INC.

DATE SAMPLED	RECOVERY SYSTEM WELLS					WATER TREAT. COMP.	MONITORING/ OBSERVATION WELLS			SURFACE WATER		
	RS-1A	RS-1B	RS-1C	RS-1D	AVG.		X-6	X-7	MI-9	D-1	D-2	D-3
9/10/97	395	393	48	80	229	NA						
9/11/97	348	398	49	71	217	NA						
9/12/97	345	350	38	70	201	NA			3.29			
9/13/97	NA	NA	NA	NA	NA	NA						
9/14/97	NA	NA	NA	NA	NA	NA						
9/15/97	358	352	42	72	206	NA			4.23			
9/16/97	383	372	46	87	222	NA						
9/17/97	373	376	43	79	218	NA						
9/18/97	330	350	37	79	199	NA						
9/19/97	314	343	37	70	191	NA			3.96			
9/20/97	NA	NA	NA	NA	NA	NA						
9/21/97	NA	NA	NA	NA	NA	NA						
9/22/97	287	268	29	116	175	NA						
9/23/97	341	320	37	71	192	NA			4.66			
9/24/97	320	235	26	74	164	NA						
9/25/97	199	221	23	75	130	NA						
9/26/97	238	219	24	75	139	NA						
9/27/97	NA	NA	NA	NA	NA	NA						
9/28/97	NA	NA	NA	NA	NA	NA						
9/29/97	NA	NA	NA	NA	NA	NA						
9/30/97	333	296	35	70	183	NA			2.89			
10/1/97	385	404	42	110	235	NA						
10/2/97	311	320	38	65	183	NA						
10/3/97	373	361	40	101	219	NA			3.67			
10/4/97	NA	NA	NA	NA	NA	NA						
10/5/97	NA	NA	NA	NA	NA	NA						
10/6/97	365	353	37	82	209	NA				NA	17.2	18.8
10/7/97	378	346	36	77	209	NA			3.82			
10/8/97	338	318	34	70	190	NA						
10/9/97	NA	NA	NA	NA	NA	NA						
10/10/97	308	254	30	71	166	NA			2.85			
10/11/97	NA	NA	NA	NA	NA	NA						
10/12/97	NA	NA	NA	NA	NA	NA						
10/13/97	320	292	33	82	182	NA						
10/14/97	263	234	28	56	145	NA			3.03			
10/15/97	304	274	26	59	166	NA						
10/16/97	350	291	30	56	182	NA						
10/17/97	419	358	39	71	222	NA			3.66			
10/18/97	NA	NA	NA	NA	NA	NA						
10/19/97	NA	NA	NA	NA	NA	NA			2.80			
10/20/97	274	217	27	78	149	NA						
10/21/97	404	351	35	80	217	NA			2.80			
10/22/97	334	240	30	70	168	NA						
10/23/97	329	327	34	69	190	NA						
10/24/97	256	242	24	67	147	NA			2.32			
10/25/97	NA	NA	NA	NA	NA	NA						
10/26/97	NA	NA	NA	NA	NA	NA						
10/27/97	353	298	35	73	190	NA						

**TABLE 2**  
**SUMMARY OF ZINC CONCENTRATIONS (MG/L)**  
**GROUNDWATER RECOVERY SYSTEM PERFORMANCE REPORT - NOVEMBER 1997**  
**MADISON INDUSTRIES, INC.**

DATE SAMPLED	RECOVERY SYSTEM WELLS					WATER TREAT. COMP.	MONITORING/ OBSERVATION WELLS			SURFACE WATER		
	RS-1A	RS-1B	RS-1C	RS-1D	AVG.		X-8	X-7	MI-9	D-1	D-2	D-3
10/28/97	287	227	26	63	151	NA			3.36			
10/29/97	282	228	32	55	149	NA				1.8	24.3	7.2
10/30/97	272	290	29	84	169	NA						
10/31/97	297	291	31	77	174	NA			2.82			
11/1/97	NA	NA	NA	NA	NA	NA						
11/2/97	NA	NA	NA	NA	NA	NA						
11/3/97	293	209	29	66	149	NA						
11/4/97	313	299	33	68	178	NA			6.2			
11/5/97	307	250	30	70	164	NA						
11/6/97	372	324	34	106	209	NA						
11/7/97	326	271	30	68	174	NA			3.17			
11/8/97	NA	NA	NA	NA	NA	NA						
11/9/97	NA	NA	NA	NA	NA	NA						
11/10/97	327	303	30	99	190	NA						
11/11/97	308	300	32	64	176	NA			4.02			
11/12/97	360	322	34	66	196	NA						
11/13/97	254	232	26	70	145	NA						
11/14/97	427	393	40	90	238	NA			4.18			
11/15/97	NA	NA	NA	NA	NA	NA						
11/16/97	NA	NA	NA	NA	NA	NA						
11/17/97	348	314	32	90	196	NA						
11/18/97	305	216	22	73	154	NA			2.51			
11/19/97	380	307	33	78	199	NA						
11/20/97	357	269	26	72	181	NA						
11/21/97	329	235	29	81	168	NA			2.74			
11/22/97	NA	NA	NA	NA	NA	NA						
11/23/97	NA	NA	NA	NA	NA	NA						
11/24/97	350	336	34	84	201	NA			2.67			
11/25/97	394	352	38	73	214	NA						
11/26/97	358	274	30	68	183	NA						
11/27/97	NA	NA	NA	NA	NA	NA						
11/28/97	NA	NA	NA	NA	NA	NA						
11/29/97	NA	NA	NA	NA	NA	NA						
11/30/97	NA	NA	NA	NA	NA	NA						
12/1/97	NA	NA	NA	NA	NA	NA						
12/2/97	NA	NA	NA	NA	NA	NA						
12/3/97	257	165	17	66	126	NA				1.0	19.3	6.1
MINIMUM	199	165	17	55	126	95	249.0	107.0	2.08	0.2	1.6	5.9
MAXIMUM	1290	1630	1860	1210	1430	1095	1500.0	1210.0	1040.00	3.5	34.3	33.9
AVERAGE	575	618	213	195	399	424	874.5	658.5	70.41	1.1	16.4	16.1

**NOTES:**

N/A - Not Applicable (sampling/analysis not conducted)

All analysis performed by Madison Industries, Inc.

All concentrations in milligrams per liter (mg/l)

**TABLE 3**  
**SUMMARY OF ZINC CONCENTRATIONS FOR SELECTED WELLS AND SURFACE WATER (MG/L)**  
**PERFORMANCE MONITORING PERIOD RESULTS**  
**GROUNDWATER RECOVERY SYSTEM PERFORMANCE REPORT - NOVEMBER 1997**  
**MADISON INDUSTRIES, INC.**

SAMPLE I.D. NUMBER	WELL DEPTH (S/D)	PMP PERIOD											
		NO. 16 12/94	NO. 17 3/95	NO. 18 6/95	NO. 19 9/95	NO. 20 12/95	NO. 21 3/96	NO. 22 6/96	NO. 23 9/96	NO. 24 12/96	NO. 25 3/97	NO. 26 6/97	NO. 27 9/97
MI-2A	S	81.00 *	2.00	46.00 *	105.00 *	256.00 *	324.00 *	1040.00 *	1070.00 *	NA	3.70	3.52	4.18
MI-7	S	8.10 *	7.00 *	5.80 *	5.80 *	7.60 *	7.00 *	4.00	6.40 *	5.40 *	4.30	3.15	4.49
MI-9	S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20.90 *	4.55
MI-T1	S	2.90	6.00 *	3.80	2.70	2.90	2.65	2.30	2.40	2.30	2.10	2.18	2.06
RS-1A	S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	639.00 *	398.00 *
RS-1B	S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	93.60 *	44.10 *
RS-1C	S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	155.00 *	79.90 *
RS-1D	S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	155.00 *	79.90 *
RW-2	S	1.70	1.50	2.00	3.10	2.35	3.00	2.60	2.30	1.50	1.50	1.20	1.20
RW-4	D	74.00 *	49.00 *	96.00 *	71.00 *	96.00 *	66.00 *	42.00 *	41.50 *	30.00 *	26.50 *	2.13	0.81
RW-6	S	460.00 *	160.00 *	288.00 *	272.00 *	288.00 *	392.00 *	500.00 *	56.00 *	180.00 *	14.00 *	7.75 *	7.01 *
WCC-11M	D	72.00 *	80.00 *	188.00 *	176.00 *	52.00 *	164.00 *	120.00 *	38.50 *	22.80 *	14.70 *	1.80	0.83
WCC-12	D	0.68	1.40	3.40	1.40	0.65	0.32	0.78	0.42	1.09	0.53	0.60	1.10
WCC-15M	D	20.00 *	6.80 *	11.00 *	3.80	2.25	2.80	35.60 *	43.00 *	15.40 *	5.55 *	5.53 *	5.05 *
WCC-16VS	S	11.00 *	12.00 *	13.50 *	16.60 *	44.00 *	15.50 *	14.80 *	11.80 *	4.60	3.54	4.92	4.87
SW-2	NA	35.00	2.00	NA	NA	NA	3.60	470.00	415.00	18.20	34.40	22.70	28.30

**NOTES:**

S - Designated as a shallow well (< 40 feet in depth)

D - Designated as a deep well (> 40 feet in depth)

All analyses performed or subcontracted by CORE LABORATORIES (N.J. Certification No.: 12010)

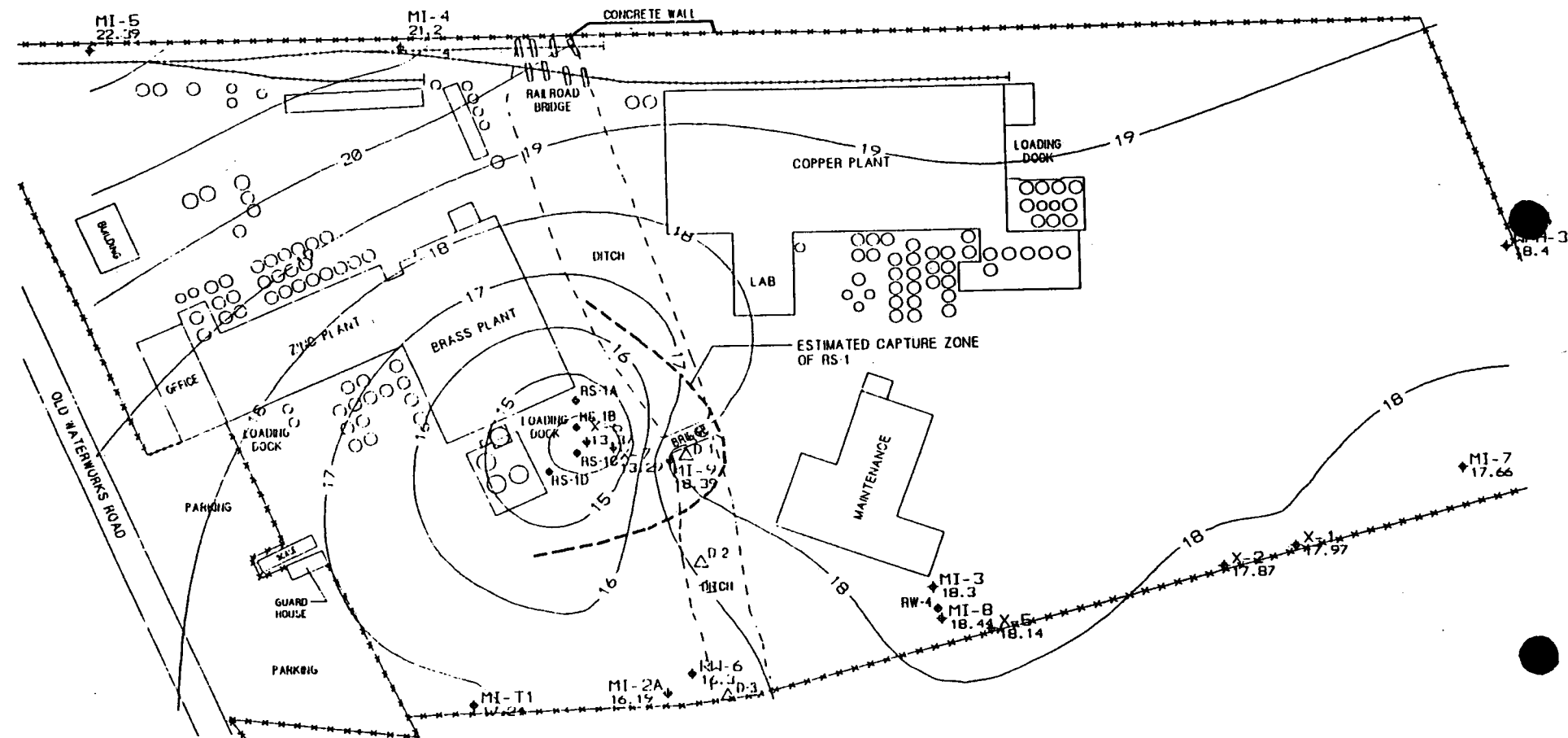
mg/l - Milligrams per liter

blank - Not detected (below Method Detection Limit of .030 mg/l)

NA - Not Applicable/Not Available

MI-2A replaced MI-2 beginning PMP No. 25

\* - Exceeds NJ Class II groundwater criteria or PQL, as appropriate; NA for SW samples.



#### GENERAL NOTES:

GENERAL LAYOUT DERIVED FROM DRAWINGS PREPARED  
BY CONCEPT ENGINEERING CONSULTANTS, P.A.  
SOME LOCATIONS AND DETAIL APPROXIMATE



#### KEY:

- ◆ MI-2A 16.19 SHALLOW MONITORING WELL  
GROUNDWATER ELEVATION (FT. ABOVE MSL)
- RS-1A SHALLOW RECOVERY WELL  
(DATA NOT USED IN CONTOUR CALCULATIONS)
- 16 — ESTIMATED GROUNDWATER ELEVATION  
CONTOUR (FT. ABOVE MSL)
- BUILDING OR STRUCTURE
- △ D-3 SURFACE WATER SAMPLING LOCATION

GROUNDWATER LEVEL CONTOUR MAP  
NOVEMBER 24, 1997

GROUNDWATER RECOVERY SYSTEM  
PERFORMANCE REPORT

**Madison**  
industries inc.

FIGURE  
1

FIGURE 2 - AVERAGE ZINC CONCENTRATIONS -- RS-1

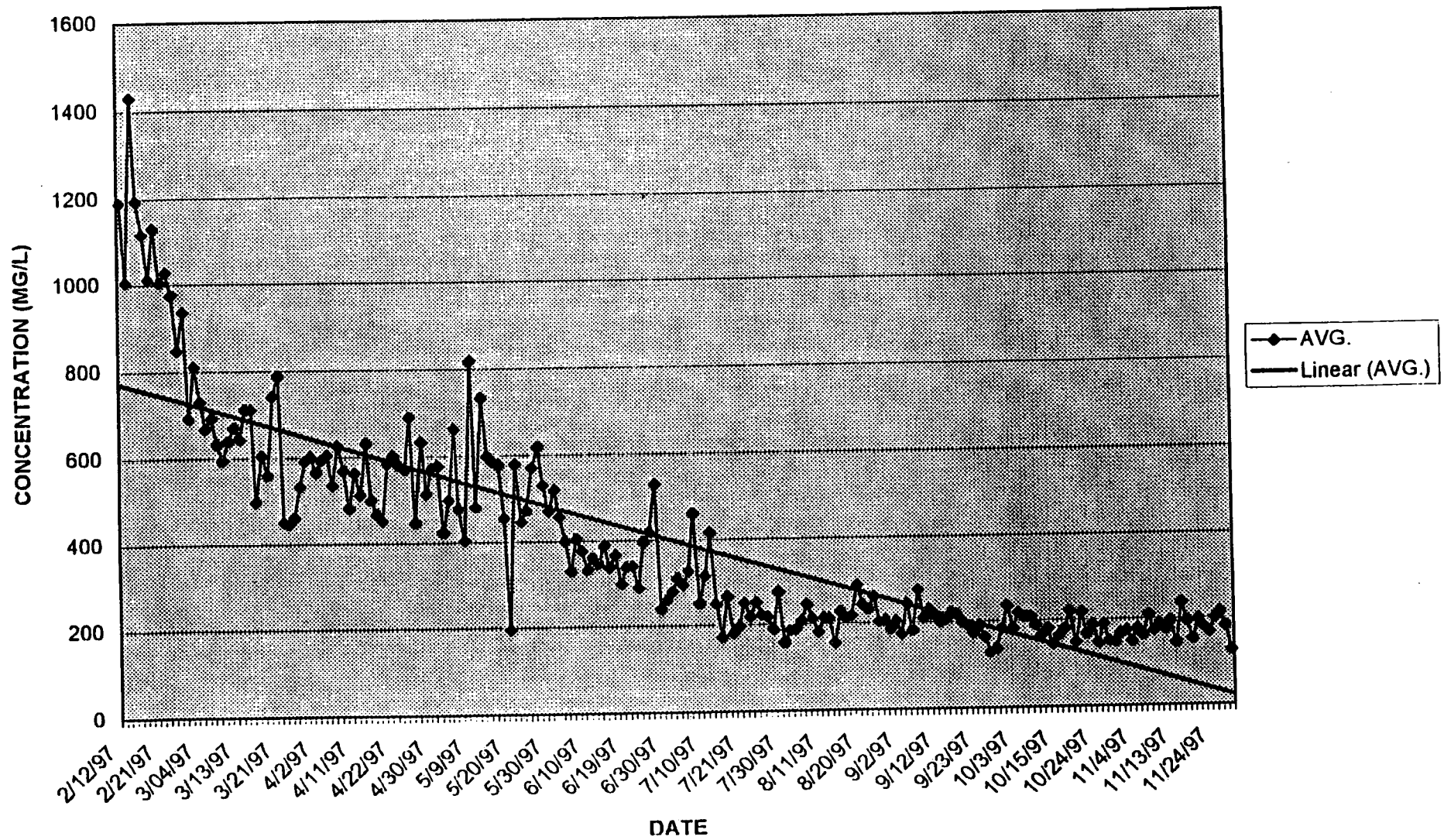


FIGURE 3 - ZINC CONCENTRATIONS  
RS-1A AND RS-1B

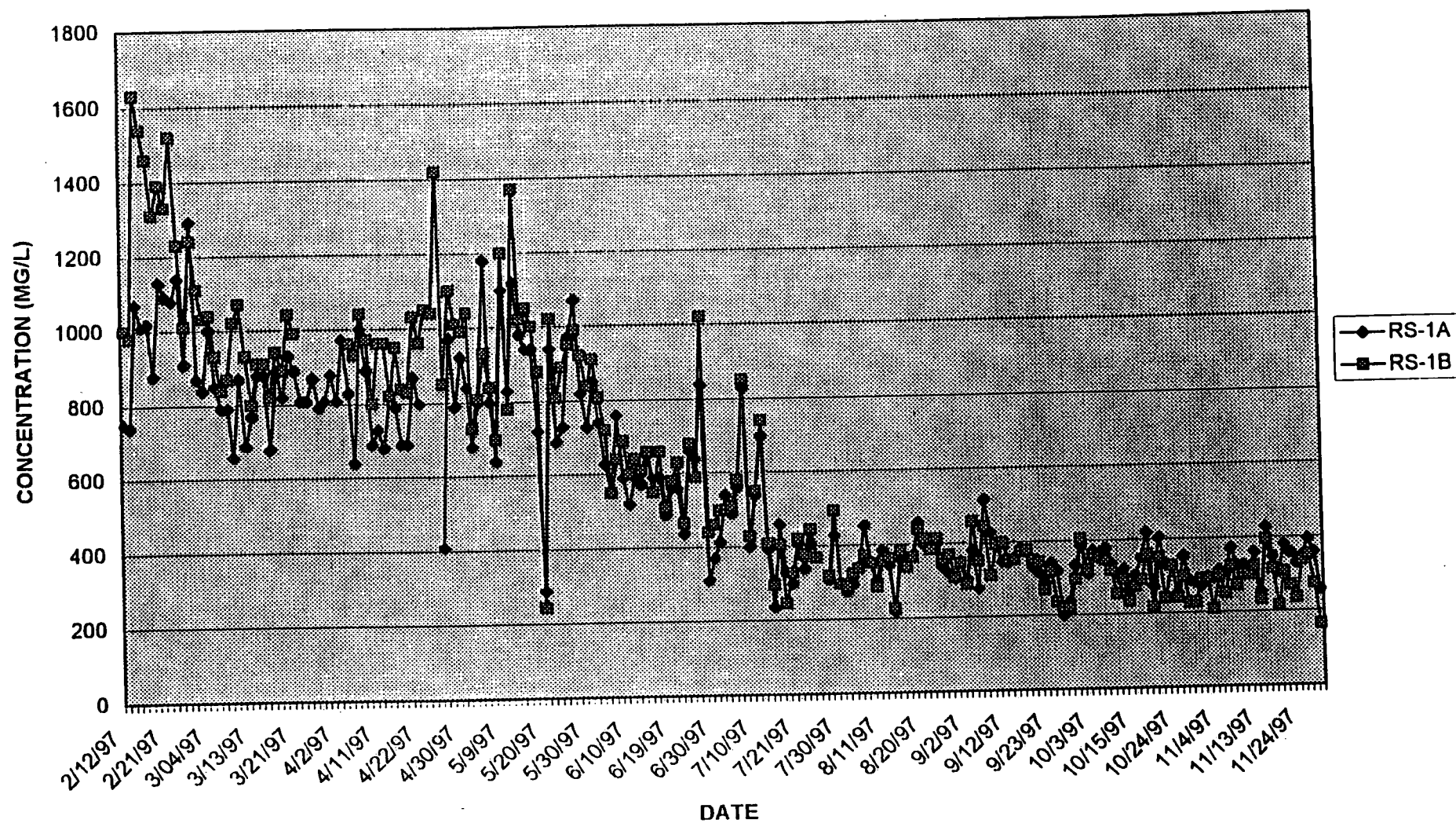


FIGURE 4 - ZINC CONCENTRATIONS  
RS-1A AND RS-1B  
JULY 1, 1997 THROUGH DECEMBER 3, 1997

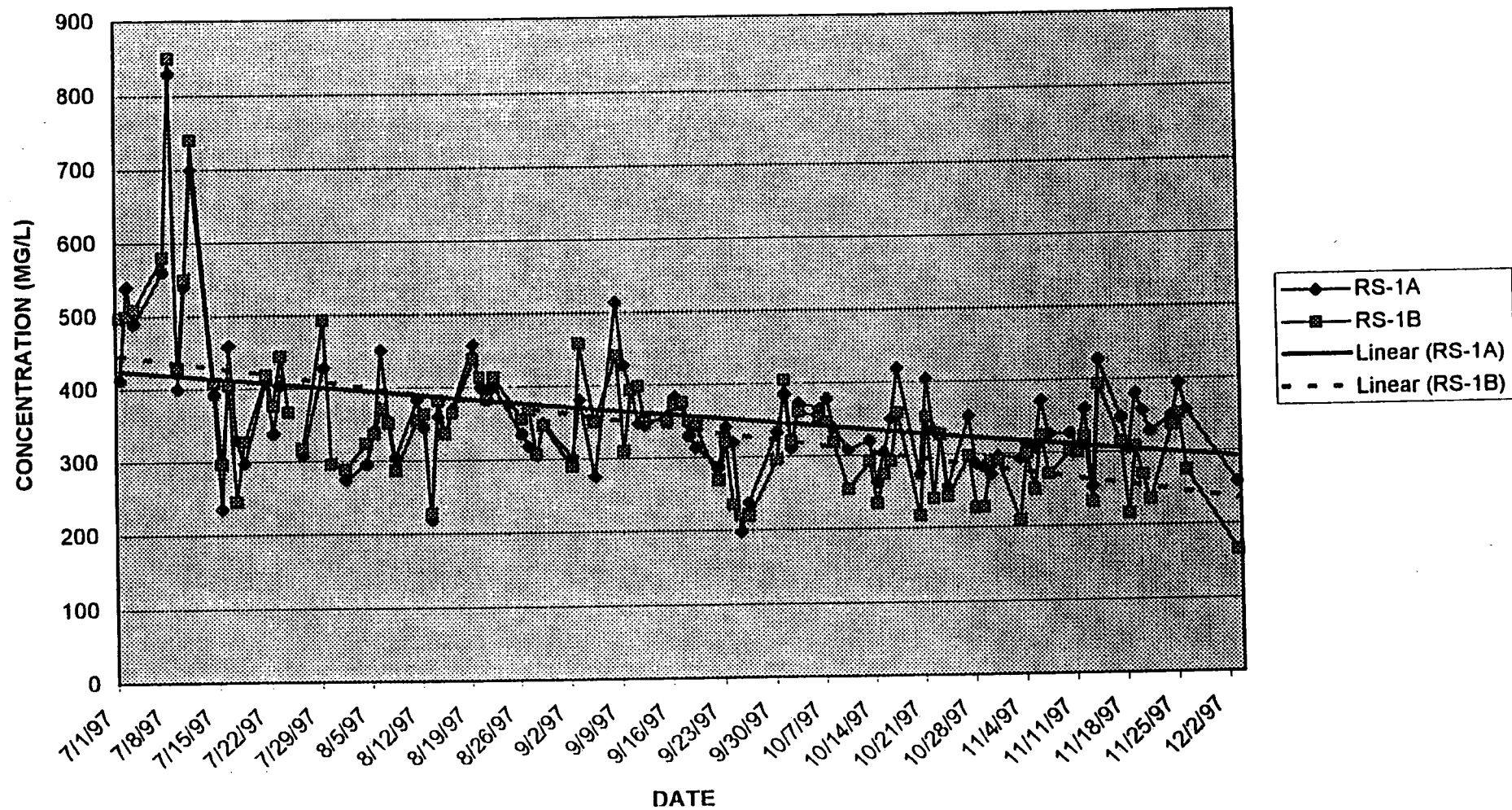


FIGURE 5 - ZINC CONCENTRAIONS  
RS-1C AND RS-1D

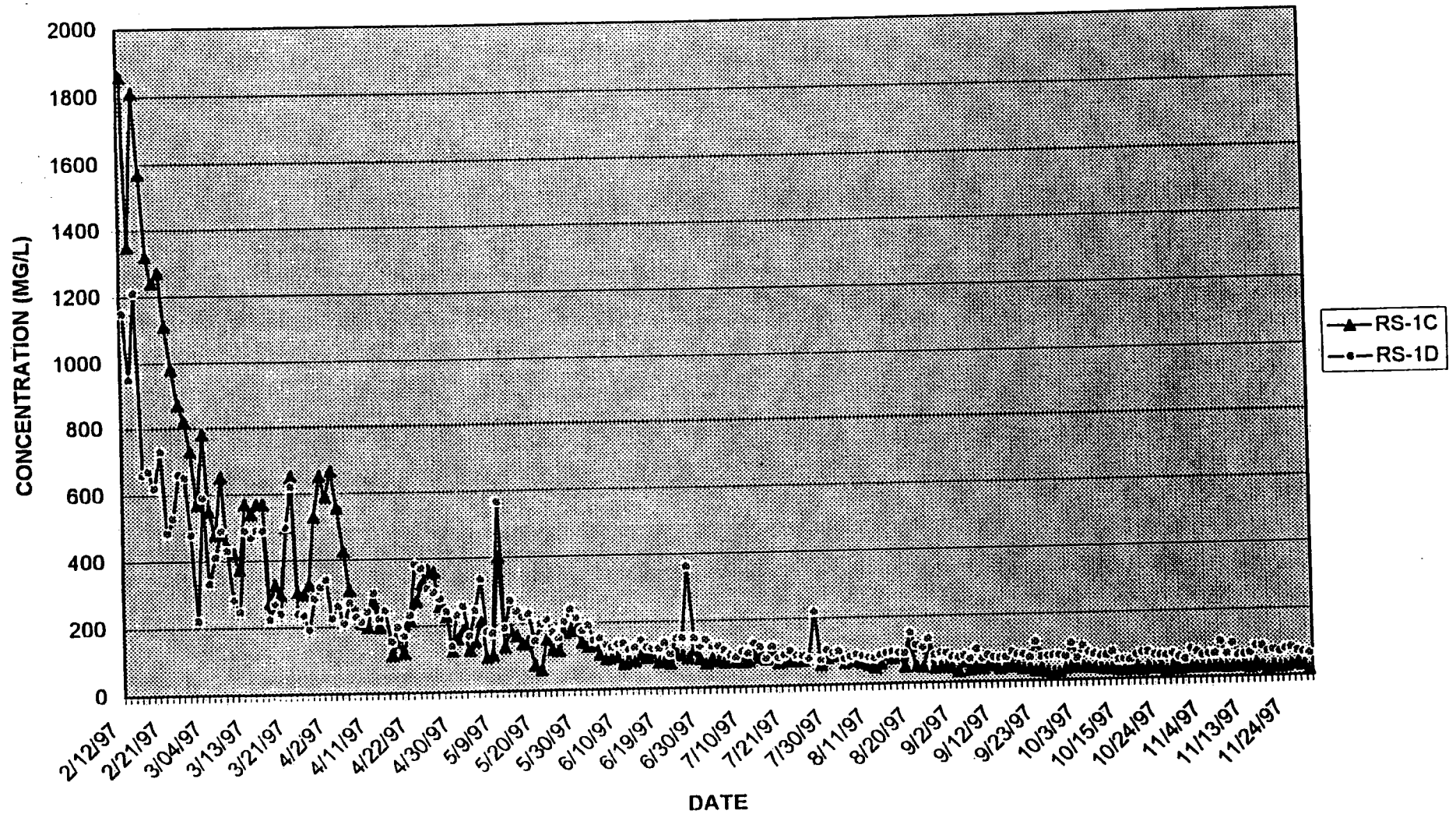


FIGURE 6 - ZINC CONCENTRATIONS  
RS-1C AND RS-1D  
JULY 1, 1997 THROUGH DECEMBER 3, 1997

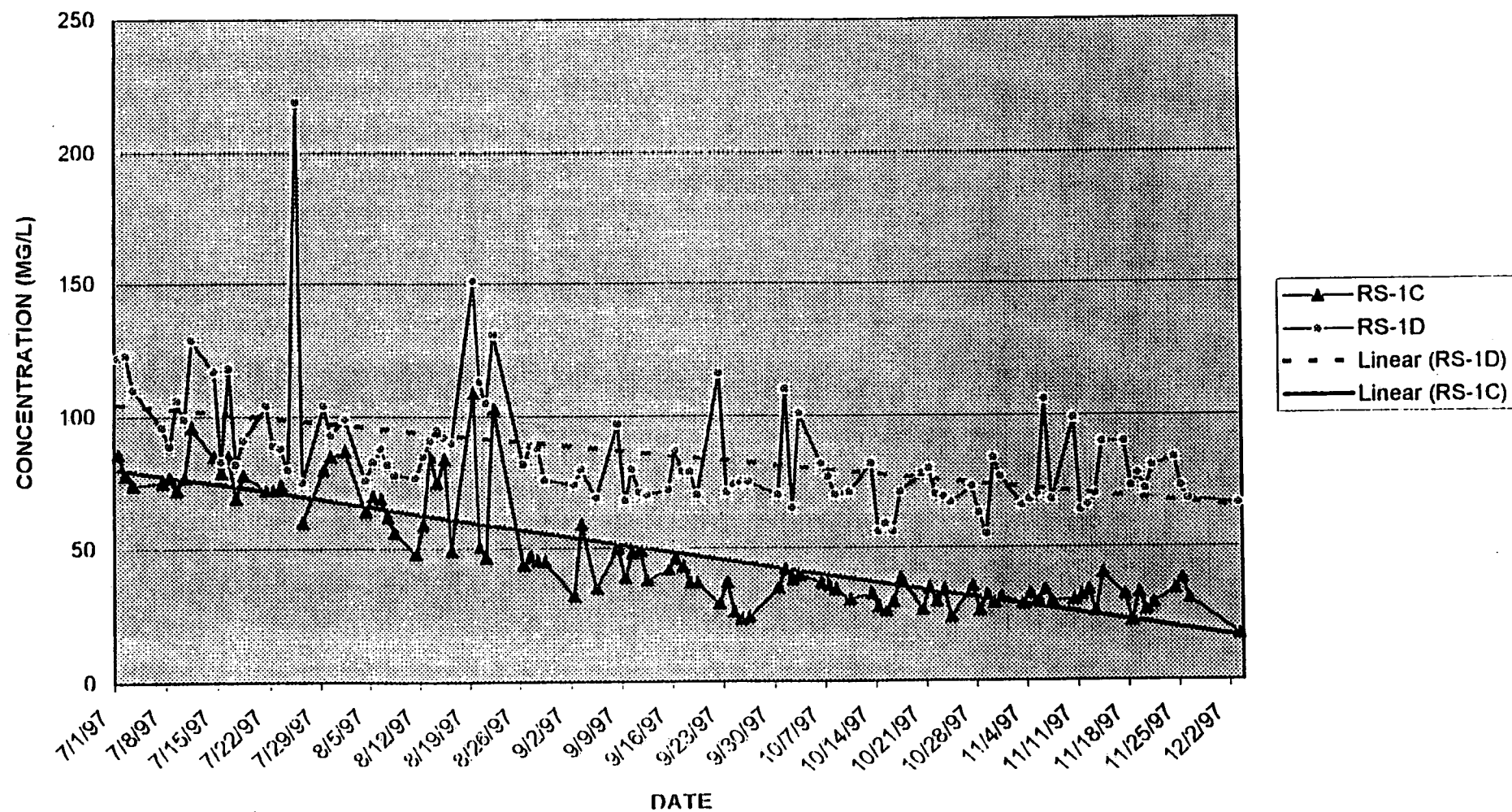


FIGURE 7 - ZINC CONCENTRATIONS -- SELECTED WELLS  
PERFORMANCE MONITORING PROGRAM RESULTS

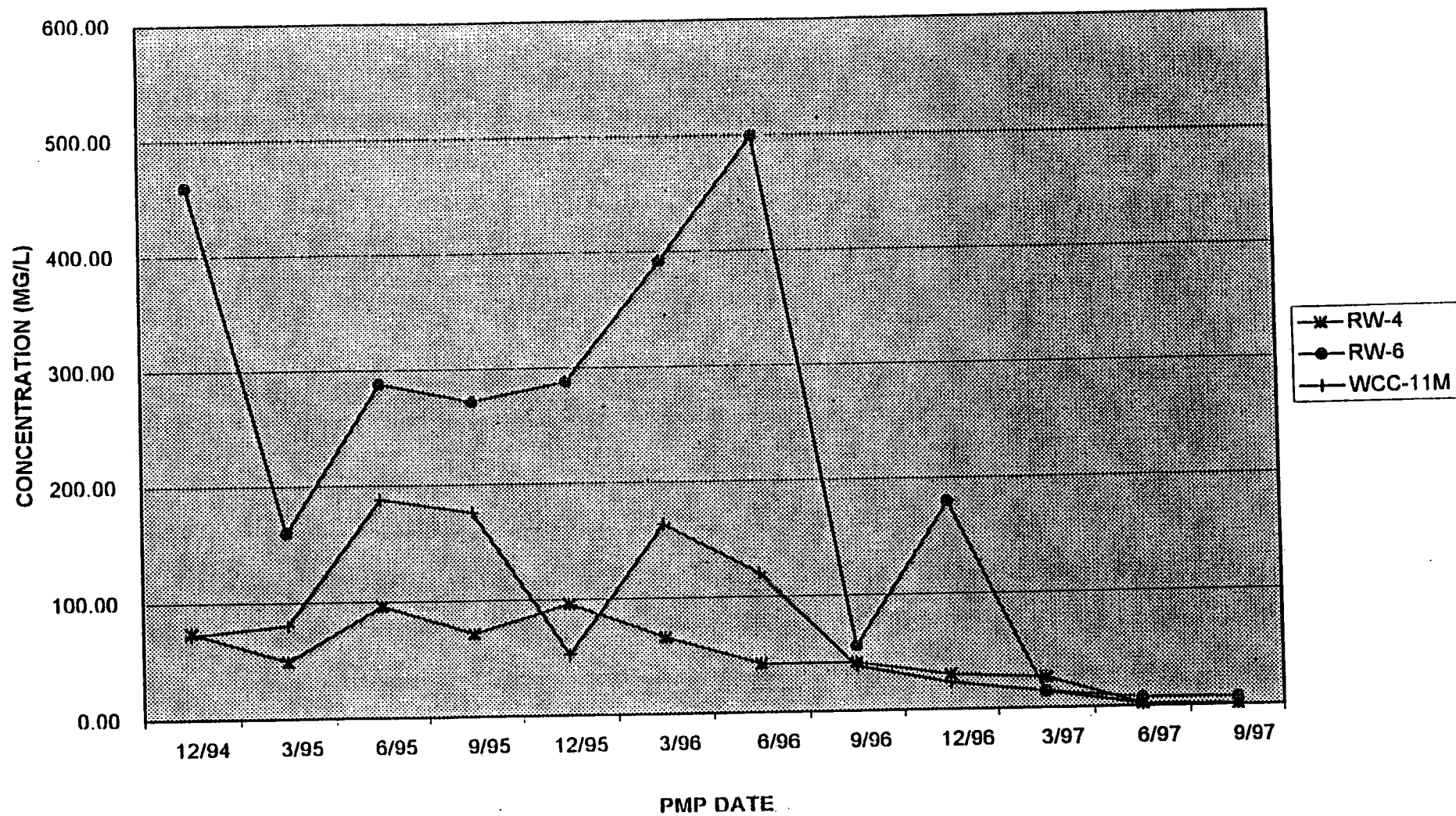


FIGURE 8 - ZINC CONCENTRATIONS -- SURFACE WATER

